# ORBIT

Preliminary Issue No. 1
October 1969

A publication of The Ontario Institute
for Studies in Education

Ideas about teaching
and learning

P1

## Voices from the Past/A Teaching Aid

Many of the voices on the attached flexible disc were originally recorded before the turn of the century; consequently, the statements are often brief, and it is not always easy to make out what is being said. Nevertheless, we hope these voices will add a new and living dimension to some famous people that students (and, indeed, teachers) have previously come across only as faded portraits in books. Where the words are extremely indistinct, we have spelled out the full text below.

With the exception of Rutherford, Debye, and Cockcroft, the selections contained on this record have been taken from a set of two records, *Voices of History* (U.S. $6.95 for the set), which include many other historic voices besides those reproduced here.

We are grateful to the Voices of History Recording Society, 641 Lexington Avenue, New York, N.Y. 10022, for granting us permission to use these selections.

On some record players, it may be necessary to put an ordinary rigid record on the turntable before placing the flexible disc in position. It is unnecessary to trim the disc to a circular shape.

Suggestions from readers for teaching aids would be welcome.

### Side 1

*1. Florence Nightingale (1820–1910)* : 'When I am no longer even a memory, just a name, I hope my voice brings to history the great work of my life. God bless my dear old comrades of Balaklava and bring them safe to the Shore–Florence Nightingale.' Recorded in 1890.

*2. Kenneth Landfrey (1833–1895),* the bugler who sounded the advance for the charge of the Light Brigade at Balaklava in 1854, sounding the advance once again.

*3. Sir Henry Morton Stanley (1841–1904),* remembered by most for his masterly understatement, 'Dr. Livingstone, I presume ?' His greeting to the President of the United States was recorded during a visit to Canada.

*4. Theodore Roosevelt (1858–1919)* campaigning in the United States presidential elections of 1912 after he had left the Republicans to form his own party.

*5 Robert Browning (1812–1889)* : ' "I sprang to the stirrup, and Joris, and he ; I galloped, Dirck galloped, we galloped all three." I'm terribly sorry, but I can't remember the author–Robert Browning.' Recorded in 1888.

*6. Count Leo Tolstoy (1828–1910)* : 'In this same way, we now have some who do not pay heed to the instructions for the guidance of our life, written in our heart and in all the great teaching of the wisest of mankind.' Recorded at the beginning of this century.

*7. Sir Arthur Sullivan (1842–1900)* : 'For myself I can only say that I am disturbed and somewhat terrified at the result of this evening's experiment ; astonished at the wonderful thing that you have developed and terrified at the thought that so much hideous and bad music may be put on records forever. But all the same, I think this is the most wonderful thing that I have ever experienced and I congratulate you with all my heart on this wonderful discovery.'

*8. Sir Arthur Conan Doyle (1859–1930)* describing how Sherlock Holmes came into being.

*9. Rudyard Kipling (1856–1936)* endorsing the immortal quality of words.

### Side 2

*1. Thomas Edison (1847–1931)* using one of his many inventions, the phonograph, to address a conference of electrical engineers in 1908 : 'When I look around at the resources of the electrical field today, as shown in this exhibition, I feel that I would be glad to begin again my work as an electrician and inventor, and we veterans can only urge upon our successors, the younger followers of Franklin and Kelvin, to realize the measure of their opportunities and rise to the height of their responsibilities in this day of electricity.'

*2. Guglielmo Marconi (1874–1937)* describing the first trans-Atlantic wireless transmission : 'On December first, nineteen hundred and one, within a haphazard receiving station rigged up by myself in St. John's, Newfoundland, I was able to receive a succession of three clicks corresponding to the three dots of the letter "s" launched by the Morse key on the other side of the Atlantic Ocean.'

*3. Lord Rutherford (1871–1937)* discussing the state of knowledge in atomic physics during the early thirties. A New Zealander by birth, Rutherford was research professor of physics at McGill University from 1898 to 1907.

*4. Peter Debye (1884–1966)* describing the experiment in 1916 whereby he and Paul Scherrer arrived at a technique for the X-ray analysis of powdered substances–from an interview at Cornell University shortly before his death. He was awarded the Nobel Prize in Chemistry in 1936.

*5. Sir John Cockcroft (1897–1967)* discussing the apparatus with which he and Ernest Walton carried out nuclear transmutations, in 1932, using artificially accelerated protons–from an interview at Churchill College, Cambridge, three years before his death. For this achievement, he and Walton were awarded the Nobel Prize in Physics in 1951. From 1944 to 1946, Cockcroft was in Canada–first in Montreal, then in Chalk River–where he was in charge of the Anglo–Canadian atomic energy project.

## From the Director of OISE

With the publication of *Orbit*, we aim to broaden our relationship with the educational community of Ontario and stimulate interest in educational innovation at all levels.

The Institute, I sincerely believe, has much to contribute to education throughout the province. We have accomplished a certain amount already, but it is only a beginning. In the future, the extent of our contribution will depend on even closer co-operation between our research and development teams and the trustees, administrators, principals, and teachers of Ontario, from whom we have much to learn.

We are working toward a common goal–to improve the education of our children. It is my sincere hope that this journal, in its encouragement of frank discussion and its offering of new ideas, will prove of practical value and will foster among educators the spirit of cooperation essential to the attainment of this goal.

Robert W. B. Jackson

**Audience :** *Orbit* is published by The Ontario Institute for Studies in Education for everybody involved in or concerned with education.

Although *Orbit* is not written for students, we foresee no harm if copies should fall into their hands–on the contrary !

**Content :** *Orbit* features the latest information about educational research and development and, in addition to discussing work carried out by OISE and schools across Ontario, draws on material from other Canadian provinces and other countries. Les articles qui intéressent surtout les francophones paraissent en français.

**Contributions :** We should be glad to receive from readers articles about educational practice, criticisms of past issues of *Orbit*, and suggestions for future issues. Before submitting full-length articles, for which an honorarium will normally be paid, a preliminary letter should be sent to the editor.

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**Assistant Editor :** Jean Shapter
**Designer :** Burton Kramer & Associates, Toronto
**Consultant Panel :** W.R. Wees, OISE (Chairman)
J. Main, OISE/D. Brison, OISE/F. Rainsberry, OISE
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**Forthcoming Events :** 'The Teacher as a Group Leader'–a seminar in five sessions, for classroom teachers only, sponsored by OISE. To be held at the Institute. First session October 18–9 :00 a.m. to 3 :30 p.m. ; subsequent sessions October 21, 23, 28, and 30–7 :30 p.m. to 9 :30 p.m. Final registration date is October 10 and registration fee is $15. Enrollment is limited to 35 teachers.

'The Student and the Educational System'–a conference for administrators, teachers, and students, sponsored by OISE's Graduate Students' Association. To be held at the Institute. Begins the evening of November 7 and continues all day and evening of November 8. There will be a nominal fee to cover cost of dinner on evening of November 8. Attendance is limited to 180.
For further information, write to :
Mrs. June Armstrong, Conference Secretary
The Ontario Institute for Studies in Education
102 Bloor Street West, Toronto 5, Ont.

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**Subscriptions :** $3.00 per volume (5 issues), vol. 1 beginning February 1970. Not published in August. Available only to subscribers ; no individual copies for sale.

Subscription forms have been circulated but, if you do not have one, please write to Publication Sales, OISE, 102 Bloor St. West, Toronto 5, Ont., enclosing a cheque or money order payable to The Ontario Institute for Studies in Education. Please add 20¢ to out-of-town orders.

There will be two preliminary issues : no. 1 (October 1969) and no. 2 (December 1969). One free copy of preliminary issues nos. 1 and 2 will be given for each subscription received prior to October 15 ; preliminary issue no. 2 will be given free for each subscription received prior to November 1.

'No one can alter the time schedule of the human brain, not even a psychiatrist or an educator. The built-in biological clock tells the passage of learning aptitudes and the teacher's opportunity'

*Conditioning of the Uncommitted Cortex for Language Learning* by Wilder Penfield.

# an anatomy of

**How as a neurosurgeon did you become involved in language study ?**

Penfield : That's quite easy. Back in 1928, we were working on an operation to cure epilepsy—by removing scar tissue from the cortex or outer covering of the brain. To ensure that we didn't injure any critical brain functions, we devised a method for localizing these functions in the cortex. Of all these functions, by far the most indispensable is the major speech area and, though it may sometimes be worth while to forfeit the use of an arm or a leg in order to achieve a cure for epilepsy, sacrifice of the speech area can never be justified. We mapped out the cortical area for speech in hundreds of cases and acquired a precise knowledge of the functional demarcations. Then, some time in the thirties I was asked to give a talk at Lower Canada College in Montreal, and it suddenly occurred to me that here was an interesting extension of my neurological work—into education and especially into the learning of language.

**What techniques did you use for locating brain functions ?**

Penfield : Much of the information has come to us from the work of others, but there was one main technique that we used. Before the operation, the patient was given a local anesthetic ; then a gentle electrical stimulus was applied to the cortex by touching it with an electrode through a trapdoor opening in the skull. From the response of the patient, who was conscious, we were able to map out the general functional areas of the brain very exactly. We were also able to confirm our results from the operations in which there had been actual removal of tissue.

**Is this technique of applying an electrical stimulus still in use today ?**

Penfield : Yes it is—although we can work a little faster these days. In fact, Doctor Rasmussen, the Director of the Montreal Neurological Institute, is studying a case right now.

**How closely mapped out are brain functions now ?**

Penfield : For speech, the cortex is mapped out in detail. We also have a fairly clear understanding of cortical development. For example, in primitive animals the brain areas are much more fully committed at birth either to motor or to sensory functions. But in advanced animals, and especially in man, the brain of the new-born has areas of uncommitted cortex that are, so to speak, like blank pages waiting to be written upon. In man, part of this uncommitted cortex is used for speech and is located in the dominant hemisphere—usually the left. Our experience has been that up to about the age of twelve injury to this area results at first in loss of speech, but speech recovery follows owing to transfer of the speech functions to the uncommitted cortex in the non-dominant hemisphere. After the age of twelve, this transfer does not happen—because the cortex in the non-dominant hemisphere is committed to other brain functions such as perception—and the patient loses permanently his powers of speech.

**Is this commitment of brain areas like filling a bottle ?**

Penfield : Not really, though from the educator's point of view, this is how it might seem. I look on it this way : the mind and the brain must be looked upon as independent. The mind programs the brain as a person programs a computer ; the mind decides to what sort of stimuli attention will be paid. How it does this is another story and is still a very great mystery to us. It is this I have been studying for the past few years.

**How do you relate physiological understanding of brain mechanisms to second language learning ?**

Penfield : I believe the mechanism for first and second language learning is the same. It has become evident that in the brain of a small child a frame is set up for language learning. When a second language is presented, the language fails to fit the first

Dr. Wilder Penfield, O.M., C.M.G., President of the Vanier Institute of the Family, is interviewed by Hugh Oliver, editor of this journal. Dr. Penfield is internationally renowned for his scientific research into the functions of the brain and his skill as a neurosurgeon. He was the Director of Montreal Neurological Institute for twenty-six years, and he is also the author of two historical novels.

# Language Learning

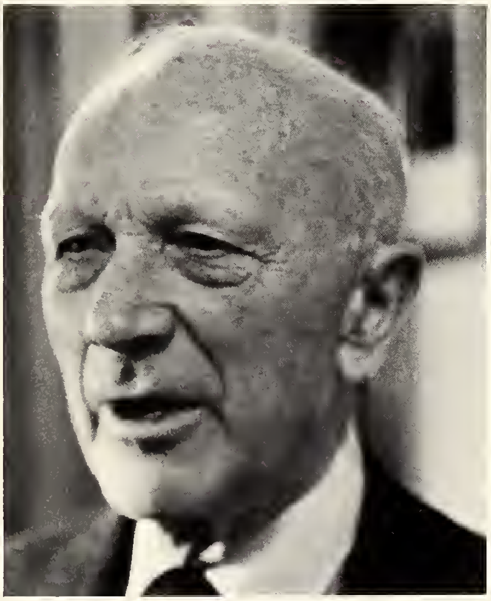
frame and a second frame is set up. Similarly with a third language. This the child accomplishes with ease, and the oft-quoted statement that the child shouldn't be confused in this way is completely false: the sooner he forms a second-language frame, the better. Nor is it simply brain-stimulation evidence that supports this conclusion, but observation supports it too. And in later life, when it comes to learning a third or fourth language, those who learned a second language as children are better equipped to learn another language in the manner of a child.

In Canada, we have plenty of evidence from immigrants of this difference between child and adult learning: the child learns the language easily and perfectly; the old man has a struggle and almost always retains a strong accent.

**What support have your ideas received?**

Penfield: From educators, they have received considerable support. Psychologists, too, have quite often requested to print my material. About the only contrary opinions have come from people who wish to promote a single language for political reasons.

**You have described this method of teaching young children, I believe, as 'the mother's method.'**



Penfield: Yes, I have. It is the spontaneous language-teaching method to which the human brain is naturally adapted. By contrast, the dead-language technique used in most of our schools was designed for adults learning Greek and Latin and relies on word lists and grammar. This technique may have its place, but not in the early years when the child is adept at language initiation.

**What about the crash courses currently being used to teach languages to adults?**
**They are quite successful, I gather.**

Penfield: The difficulty is they apply the mother's method to the adult brain. Often this works but, as results show, it works much better with brains that are already bilingual. The secret of this greater capacity of the bilingual brain to learn a third language appears to be what might be called a 'switch mechanism,' a conditioned reflex whereby the brain unconsciously switches to the appropriate frame for the language being presented.

The earlier this switch mechanism for language is implanted in the brain the more easily it will operate in later life, because it is only in the young that a perfect language frame can be set up. Going on from this, it is my firm opinion (and I have some evidence to support me) that the brain of a bilingual person is better than it would have been had he been unilingual; and I mean 'better' in a general sense, not simply a verbal one, although this of course is hard to demonstrate.

**Your views have had a specially marked influence on the development of second-language teaching policy in the elementary schools in the United States. Have these views been rightly interpreted?**

Penfield: Yes, they have. The American Modern Language Association circulated some of my ideas to their whole membership, and this has resulted in quite a few efforts to teach a second language at the level of kindergarten and the early grades.

**What about the impact of your views in Canada ?**

Penfield : Here the impact has been rather less widespread, although I understand they have worked when they've been tried. I believe the Toronto French School and its sister schools in other areas have adopted them with considerable success.

**If you had your own way, how, ideally, would you like to see the teaching of language organized in a school system ?**

Penfield : I have definite views about this. I should start with kindergarten by introducing the system of parallel bilingualism, which I have seen work very well. With my own children, who would be learning English from their mother and father, I would send them to a bilingual kindergarten where one of the spoken languages was French and the other, perhaps, Russian. I should have one language spoken in the morning and the other in the afternoon by native-born teachers who don't teach language but organize play based on good kindergarten principles. I should continue this parallel bilingual teaching through kindergarten into the first grade where children get started on reading and writing. At the same time, I should ensure that my own children were presented with some English reading—two or three hours a week would be quite enough. Beyond that I don't care—I think educators have much better ideas than I have as to how second-language literature should later be studied. But as a result of their early education, my children would be trilingual in later life. In fact, my children did become trilingual before the age of six. They had German from a governess and French from a nursery school.

**Do you think your scheme is practical here in Quebec ?**

Penfield : I very much doubt it. But what I would advocate here is parallel bilingual kindergartens plus parallel bilingual first grades in French and English. The parallel presentation could be morning and afternoon or it could be two days of English and three days of French each week.
If our little ones could have English in the morning and French in the afternoon, Canada would have the best educated body of citizens in the world. And with French teachers from Quebec for all the other provinces, it wouldn't be an expensive undertaking either.

**You refer in one of your papers to a bilingual mother who spoke French to her children upstairs and English downstairs.**

Penfield : Yes, and it worked very well.
I think a lot of people could do that sort of thing, especially parents with different language origins, because it helps to develop a better brain. Jews, for example, tend to learn both English and Yiddish as small children, and that is one of the reasons, I think, for the high intellectual caliber of many Jews.

**You say in one of your papers that 'a neurophysiologist can only suggest that the human brain is capable of far more than is demanded of it today. Adjust the time and the manner of teaching to the aptitudes of the growing, changing master-organ. Then, double your demands and your reasonable expectations.' Can you apply this adjustment of time and manner of teaching to areas other than language learning ?**

Penfield : I don't know. There is no localization as far as I am aware for, say, mathematics—only for speech and perception.

**What about creativity ?**

Penfield : That is a big word. We know in a general sort of way that it is related to the activity of the frontal lobes. But I don't really see how you can teach creativity.

**Do you think localization of brain functions might become more exact in the future ?**

Penfield : Yes, but I doubt whether it will have much impact on educational timetables. I think the basis for this sort of knowledge comes from teachers presenting different subjects to different age groups in an empirical way. I've no doubt their present information is pretty well correct.

**Do you believe that there is a limit to intellectual growth and, if so, at what age ?**

Penfield : No, I don't recognize any such thing. I think we can keep the windows of the brain open, and there is no reason why a child's inquisitiveness cannot persist all the way through life—cannot indeed grow. That is what I preach to specialists : the best specialists don't close up but keep their interest in other activities.

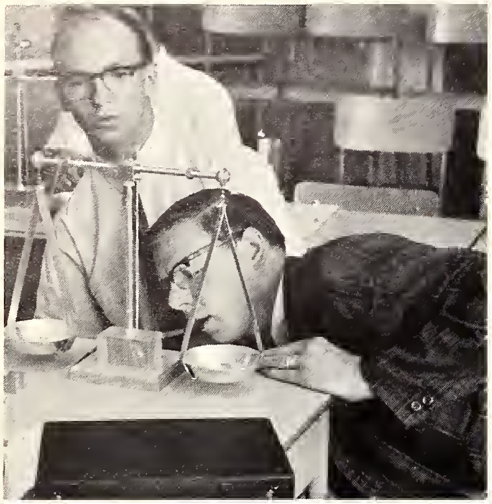
# SAMPLES– TOTAL PACKAGES– AND TEACHER EDUCATION

## Curriculum Innovation in Elementary Science

Douglas A. Roberts

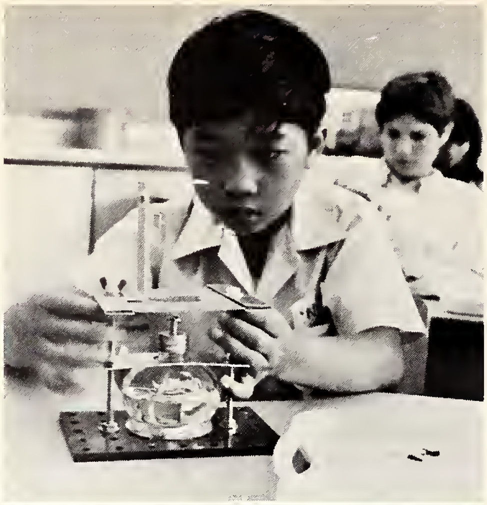
Department of Curriculum
The Ontario Institute
for Studies in Education

During the past year, over three hundred Ontario teachers have been involved in nine different eight-day workshops on the teaching of science in elementary school. This workshop program, sponsored by the Ontario Teachers' Federation (OTF) and conducted at strategic locations all over the province, continues during 1969/70.[1] (The superscript number indicates a note providing further information at the end of the article.)



During the workshops, teachers are exposed to several experimental teaching units developed by the Science Committee which was established in 1963 by the Ontario Curriculum Institute (OCI).[2] The participants try some of the activities expected of pupils, using the same equipment that pupils use, and become familiar with the teachers' manuals. They are thus able to consider the implications for their own teaching should they adopt the units for use in their classrooms.

Seven of these experimental teaching units have been printed by The Ontario Institute for Studies in Education, and four more units are in the final stages of development.[3] For all of the units, equipment must be in the hands of pupils if the teaching is to be consistent with the intent of the Science Committee. Equipment sufficient for teaching all eleven units to one class of forty pupils costs approximately $1,500, a portion of which is for consumable items. Thus, by replacing only the consumable items, a school can use one set of equipment for several different classes.[4]



## Samples and Stimulants

The eleven OISE science units in no sense constitute an entire program in elementary science, even though pupils who are taught all eleven units can learn a number of fundamental ideas, especially in the physical sciences. The units, which seem generally appropriate for use in Grades 5 to 9, are samples intended to communicate to teachers the thinking of the Science Committee, both through the printed word and through the use of materials that have been through several trial stages. The units are also designed to stimulate re-examination of science teaching in elementary schools.

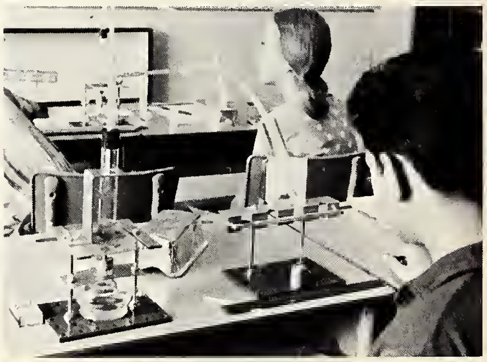
This 'samples-and-stimulants' approach is similar in purpose to that of the Nuffield Junior Science Program in Great Britain[5] and of the Elementary Science Study in the United States.[6] It is intended that the sample units (or the 'case histories' in the Nuffield materials) will serve as examples of what might be done in elementary school science. Each teacher is expected to develop his own unique elementary science program, making use of sample materials that have been tried in classrooms and found to be feasible. It is anticipated that at first the samples will be used as they are. Later, though, the samples can be modified as teachers wish. More important, they can be used as examples by teachers developing new units (or 'cases') on their own. The following note in a recent issue of the Science Committee's *Newsletter* (no. 3, January 1969, p. 10) epitomizes this expectation.

*Can your pupils devise a balance to weigh a rabbit-size animal? Try the steelyard principle to do so. If you succeed, try measuring the efficiency with which an animal such as a rabbit converts food into rabbit or more rabbits as the case may be.*

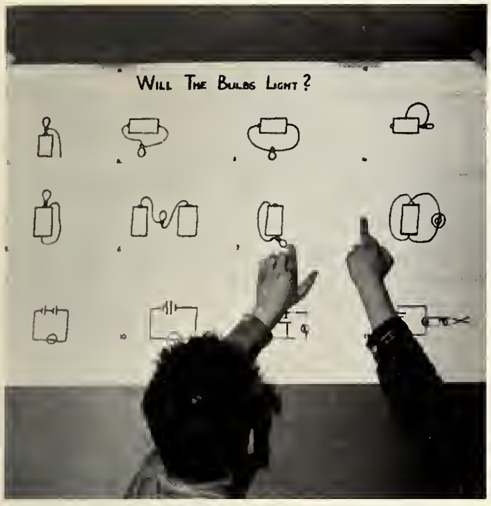
*In a word: if open-endedness is catching why should the Committee make more units for you? If it is not catching, what are we doing wrong?*

## Total Packages

In sharp contrast to the 'samples-and-stimulants' approach is the 'total-package' approach adopted by at least two elementary science curriculum projects in the United States.[7] Total science-teaching programs for elementary schools have



been developed by the Commission on Science Education of the American Association for the Advancement of Science (AAAS)[8] and by the Science Curriculum Improvement Study (SCIS).[9] Teachers are *not* expected to modify the materials in these programs or to develop new ones using these as examples–quite the contrary. They are expected to study and understand the philosophy of the curriculum architects and to follow the style of teaching that is needed to carry out the program.[10]


WILL THE BULBS LIGHT ?

[redacted]

## Comparing the Two Approaches

There are two major differences between these approaches. First, a set of total-package materials provides pupils with planned sequential development of selected scientific ideas and/or processes (as does a textbook series). While progressing through elementary school, an individual child thus encounters a coherent, systematic program designed to 'lead somewhere' gradually but surely.[11] Samples-and-stimulants materials are not designed to provide this kind of sequence. Instead, they are centered on a variety of topics but achieve coherence through a consistent teaching style.

[redacted]

[redacted]

Second, and more important from an immediate practical standpoint, the two approaches place quite different obligations upon teachers. Any set of curriculum materials (package *or* sample) is a predictive device. The objectives, or predictions about consequences for pupils, are tested during production for their occurrence under specified classroom conditions, and the claim is made that the materials will accomplish the objectives *if the specified conditions are met*. The production of such a predictive device requires a thorough understanding of the ideas to be taught, considerable expertise at measurement and evaluation, skill at translating objectives (usually stated in philosophical terms) into observable actions by pupils, and plenty of just plain 'knowing one's stuff' in the classroom.

[redacted]

While both approaches require the use of these procedures in the development of materials, the samples-and-stimulants approach requires teachers to develop materials as well.

The main obligation of teachers who contemplate adopting a total-package curriculum is that they understand and pass judgment on the *objectives* set forth by the curriculum architects and that they learn how to teach the materials in the manner specified. Since the teacher does not have to develop his own materials, the major advantage is a saving in time. Against that, the samples-and-stimulants approach allows the teacher (and possibly students as well) more scope for flexibility, creativity, and individuality than does the total-package approach since the classroom conditions are decided by the teacher to a greater extent.

One major problem accompanying a samples-and-stimulants approach is the assumption that it will be possible administratively–and in terms of the budget–for teachers to have sufficient free time to develop, evaluate, discuss, and modify their own materials. Otherwise, it is as if one required a full day's work from a craftsman, yet supplied him with only a portion of a tool kit and expected him in his spare time to manufacture the remainder of the tools he needs.

[redacted]

## Elementary Science in Ontario

The Ontario Department of Education advocates an approach to elementary science that is closer to the samples-and-stimulants approach than the total-package approach. The most recent curriculum guide for elementary science includes suggestions, samples, and a highly flexible set of objectives. Teachers can choose from a sizable and comprehensive list.[12] Elementary science courses sponsored by the Department encourage teachers to examine and discuss a variety of sample materials rather than to become familiar in depth with the ideas and philosophy inherent in any one package.

As noted above, the OCI Science Committee also adopted a samples-and-stimulants approach by producing a limited number of sample units and making classroom assistance available through consultation and a workshop program (the forerunner of the current OTF workshops). At present, teachers can become acquainted with these sample units (and with others as well) through the OTF workshops and Department of Education courses, thereby meeting the *first* requirement of inservice education consistent with a samples-and-stimulants approach.

The *second* requirement is that teachers be taught the knowledge and skills needed for both development and evaluation of their *own* materials. Many teachers seem to develop such expertise merely by studying and discussing sample materials, trying them out in the classroom, and participating in the curriculum-building process. Others find themselves hampered by an inadequate understanding of science, of children's learning, or of evaluation procedures.

Clearly, systematic efforts must be made to provide for adequate preservice and inservice instruction of teachers in an educational community where a samples-and-stimulants approach to curriculum innovation has taken root. With the OCI Science Committee, this has been difficult in the past because of overwhelming demands to *introduce* the sample units to increasing numbers of teachers.

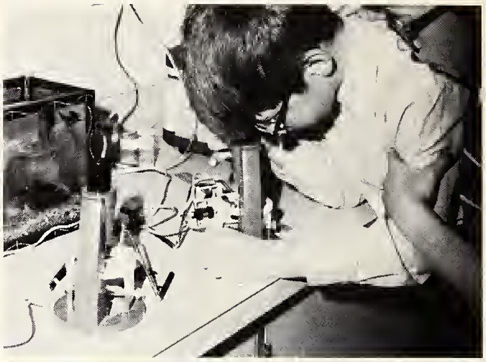
### Continuing OISE Involvement

In 1966, when the Ontario Curriculum Institute became the Office of Development within The Ontario Institute for Studies in Education, the samples-and-stimulants approach for the elementary science curriculum was continued, and in 1968 the Ontario Teachers' Federation joined forces to give further impetus to the effort.

In addition, the Department of Curriculum at OISE has launched a major project for 1969/70 to study the samples-and-stimulants approach, with a view to providing interested teacher education institutions with systematic information potentially useful for re-examining preservice and inservice programs. This project complements the work of the Science Committee from 1963 through 1969, and a related aspect is the revision of four sample units initiated several years ago by the Science Committee, and currently in draft form. These are the last of the series of sample units written by the Committee. No more sample units will be forthcoming unless some new group is constituted and produces samples to communicate a different approach to elementary science.

So that sample materials from other curriculum projects can become known in Ontario, the OISE library curriculum resource center houses a special collection of elementary science materials. These materials may be examined by all teachers, whether or not they are enrolled as students at OISE.

OISE also makes another important contribution to science education in the province through its graduate studies program leading to University of Toronto degrees in education. Specialized inservice programs within the Department of Curriculum are available on a part-time basis (after hours and summer) for teachers and others with specialized curriculum responsibilities in elementary science. These programs lead to an M.Ed. degree. In addition, full-time students can proceed to M.Ed., M.A., or Ph.D. degrees within the Department of Curriculum, with specialization in science education.[13] Such programs provide the opportunity to learn the knowledge and skills appropriate to a samples-and-stimulants approach.



The complementary roles taken by OTF, OISE, and the Department of Education all reflect the contemporary state of affairs of elementary science curriculum innovation in Ontario, and individuals at all levels of the educational system are invited to join the ever expanding network of communication about elementary science teaching. The *Newsletter* begun several years ago by the OCI Science Committee is being enlarged for this purpose,[14] and *Orbit* will also serve as a vehicle for the exchange of viewpoints and information.

*Photographs courtesy of R.E. Skinner and P.B. Park.*

## Notes

1. For information about this workshop program, contact Mr. Donald Cooper, OTF Science Consultant, 1465 Princess St., Kingston, Ont.

2. The Ontario Curriculum Institute was supported by voluntary annual contributions from the school boards and universities of Ontario, as well as by grants from the provincial government and the Ontario Teachers' Federation. Outstanding among support received from other sources was a substantial grant from the Ford Foundation of New York City. Historical information about the Science Committee can be found in *Science : An Interim Report of the Science Committee* (OCI : December 1963) and in *Science : Interim Report No. 2* (OCI: December 1964). Substantial excerpts from these two reports are also to be found in *New Designs for Learning: Highlights of the Reports of the Ontario Curriculum Institute, 1963-1966*, ed. Brian Burnham (Toronto : University of Toronto Press, 1967).

3. The seven printed units, available in limited quantity at 75¢ each from the Publications Office, OISE (102 Bloor St. West, Toronto 181, Ont.), are entitled *Matter; Measurement; Comparing Animals;Microscopy;Work and Energy; Temperature, Heat, and Energy;* and *Some Effects of Heat on Matter.*
Draft units still in development stage (and not generally available yet) are tentatively entitled 'Building a Theory' (based in part on an earlier draft unit, 'Separations,' and in part on another, 'Solutions and Crystallization') ; 'Inferring the Identity of Unknown Substances' (formerly 'Interaction of Matter with Matter') ; 'Precision in the Classification of Substances' (based in part on an earlier draft unit, 'Separations,' and in part on another, 'Solutions and Crystallization') ; and 'Introduction to the Behavior of Light.'

4. The OISE equipment is available in nine kits, each of which can be purchased separately. Information about the kits can be obtained from Reverend Paul T. Sheehan, St. Michael's College School, 1515 Bathurst St., Toronto 349, Ont., or from Spectrum Educational Laboratory Supply Company, 9 Dohme Ave., Toronto 374, Ont. The kits are experimental and are produced for the present on a limited basis, as are the units themselves (teachers' manuals) listed in note 3 above. The kits of equipment associated with the unit teachers' manuals are shown below and (assuming a class of forty pupils, and two pupils using each piece of equipment) are at present priced approximately as follows :
Kit A : Matter ( $110.00)
Kit B : Measurement ( $350.00)
Kit C : Comparing Animals ( $20.00)
Kit D : Microscopy ( $450.00)
Kit E : Work and Energy ; Temperature, Heat, and Energy ; and Some Effects of Heat on Matter ( $150.00)
Kit J : Inferring the Identity of Unknown Substances (formerly 'Interaction of Matter with Matter' and using the same equipment)
Kits K and L : Building a Theory, and Precision in the Classification of Substances (formerly for the units 'Separations' and 'Solutions and Crystallization') (Total for J, K, L : $250.00)
Kit O : Introduction to the Behavior of Light ( $225.00)

5. Books produced for teachers by the Nuffield Junior Science Program are available in Canada from Science Research Associates (Canada) Ltd., 44 Prince Andrew Place, Don Mills, Ont.

6. The *Newsletter* of the Elementary Science Study is available (free of charge) from ESS, Educational Development Center, Inc., 55 Chapel St., Newton, Mass. 02160. Teachers' guides and equipment for ESS units are available in Canada from the McGraw Hill Company of Canada Ltd., 330 Progress Ave., Agincourt, Ont. Requests for information should be directed to the attention of Mr. Michael Healy.

7. Information about science curriculum projects throughout the world is available in *Report of the International Clearinghouse on Science and Mathematics Curricular Developments* (published annually), edited by J. David Lockard and available from the Science Teaching Center, University of Maryland, College Park, Maryland 20742.

8. The *Newsletter* of the AAAS Commission on Science Education, and some materials from the project, are available from the Commission on Science Education, American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington, D.C. 20005. Teaching materials are available from the Xerox Corporation, 600 Madison Ave., New York, N.Y. 10022. (Xerox of Canada hopes to be marketing this program in Canada within a year.)

9. The *Newsletter* of the Science Curriculum Improvement Study is available (free of charge) from SCIS, Lawrence Hall of Science, University of California at Berkeley, Calif. 94720. Teaching materials are produced by Rand McNally, and are available in Canada from W.G. Gage Ltd., 1500 Birchmount Rd., Scarborough, Ont.

10. To classify the AAAS and SCIS programs in a 'total-package' category, and the OISE, Nuffield, and ESS programs in a samples-and-stimulants category, is *not* to suggest that this is the only attribute which differentiates the programs. Interested readers can find more information with which to compare programs in *New Directions in Elementary Science Teaching* by P.DeH. Hurd and J.J. Gallagher (Wadsworth Publishing Co., Belmont, Calif. 94002, 1968).

11. The sequential aspect of a 'total-package' approach is described well by Robert Karplus of SCIS : 'The content of a science curriculum must be viewed as a hierarchy of superordinate and subordinate elements and not as an enumeration of many equivalent elements' *(Journal of Research in Science Teaching* II, no. 4 [1964], 293-303). Further description of the rationale for SCIS is found in *A New Look at Elementary Science* by R. Karplus and H.D. Thier (Chicago : Rand McNally and Co., 1967).

12. See Ontario Department of Education : *Curriculum PI, JI: Interim Revision—Science* (1967), especially page 32.

13. Applicants should contact the Office of the Coordinator of Graduate Studies, OISE (102 Bloor St. West, Toronto 5, Ont.). For the part-time M.Ed. program, applicants should contact Miss Margaret Hambly. Inquiries concerning full-time programs (M.Ed., M.A., or Ph.D.) should be directed to Professor J. Glenn Scott.

14. Contributions to the *Newsletter* are welcome, including comments about classroom problems in elementary science teaching, questions to which other readers of the *Newsletter* might respond, and reactions to sample materials. These should be directed to the Editor, Mr. R.E. Skinner (Box 689, Deep River, Ont.).
To receive the *Newsletter,* contact Mr. Donald Cooper, OTF Science Consultant, 1465 Princess St., Kingston, Ont.

## CHAIRMAN OF THE BOARD

'. . . the single, most important decision any board makes is that of selecting its chief school official. . . . I am appalled by trustees who exercise greater care in the selection of janitors than in the selection of education directors.'
*Dr. L. Iannaccone*
*Professor, Harvard University*

'I throw out for your consideration that the only rational way to look at a board–executive relationship is in terms of a unified structure where the division of function and of policy-making and policy execution is useful for analysis and understanding and, to a degree, guidance; but it does not reflect the realities of what is required when individuals, with their human variables, must relate to operate an enterprise.'
*Dr. P.F. Bargen*
*Chief City Commissioner*
*Edmonton, Alberta*
*(Former Superintendent of Schools, Edmonton)*

'All groups have two basic needs. One is to operate together as a group and the other is to accomplish the goals of the group. Leadership helps the group to satisfy these basic needs in two ways. The first is through consideration–the leader is able to relate well to people, considers people as worthy human beings, and does not exercise his power unilaterally. The second is through initiating structure–the leader who is accomplished at this is able to structure jobs so that they can be tackled rationally.

'The really good leader is the person who is able to combine the two types of behavior, though they seem, very often, to be incompatible.'
*Dr. J.H.M. Andrews*
*Assistant Director, OISE*

*These comments are from the three main speakers at the June 1969 Conference Workshop on 'The Chairman of the Board,' sponsored by OISE in cooperation with the Ontario School Trustees' Council. Copies of the papers and the conference proceedings will be published early next year.*

## ADULT EDUCATION PROJECT

It is extremely difficult for a person to participate economically and socially in our present society if he lacks the necessary communication and computational skills; statistics show that of people between the ages of 20 and 64 over half have had less than two years' high school. Meetings have been held between officials of the Department of Education's Ontario Manpower Retraining Program (OMRP) and the Department of Adult Education of OISE to discuss the possibility of a project on basic adult education. To explore the dimensions of the problem, seminars were arranged with students and graduates of the existing adult education program and with teachers.

The seminar with the students indicated that while the program offers substantial benefits to the individual, his family, his employer, and the economy, it has some inadequacies. The teachers emphasized the need for a coherent program that would provide for teacher-introduced innovations and flexibility relevant to the local context, and yet maintain a provincial standard appropriate to a mobile population. The teachers identified the need for methods, instructional materials, and administrative and support services geared to adult students. They also underscored the need for inservice and preservice training of teachers to ensure subject competency and, equally important, prepare the teacher so that he can help adults.

Representatives of OMRP and OISE now believe that a development project must be initiated. Successfully carried out, it will have a major impact on the socioeconomic life of large numbers of people in the province and the nation.

## SCHOOL WITHOUT WALLS

*From the introductory booklet to Philadelphia's Parkway Program.*

'In the Parkway Program, it is true we teach some conventional subjects, but the study groups are mostly small, under ten students, and the old ways of classroom teaching just do not make any sense. So students and faculty are redefining what we mean by teaching and learning. Our faculty members teach, but when they do it is not in a classroom; it is in the city–in an office building, in City Hall, in the street, depending on what they are teaching. The city is our campus.

'The city is also our curriculum because there is nothing to learn about but the city. If education isn't useful in life, it is difficult to know why we would bother with it, so all of our work must in some way help the student to become a better, more active citizen. Students are offered a wide variety of courses, and they are asked to choose out of close to a hundred offerings those studies that seem interesting and significant to them. We find that they schedule themselves for programs well beyond the normal school hours (and also over weekends) to take courses ranging from law enforcement to modern dance, from film-making to computers, and from philosophy to model clipper ships. If we do not offer what they want, they know they can ask, and together we try to provide what they want.'

*John Bremer, Director of the Parkway Program, gave a lecture and seminar at this year's OISE summer session, and encouraged people to visit Philadelphia to find out about the program for themselves. His address is 1801 Market Street, Philadelphia, Pa. 19103.*

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## COURSES OF STUDY IN THEATRE ARTS

(Grades 7–12)

This teachers' handbook is produced by the Theatre Arts Committee, Office of Field Development, OISE, in the belief that participation in drama and theatre arts has many positive educational values.

There are course outlines for each grade from 7 to 12, and comprehensive lists of books and musical recordings for use by the teacher.

'The student should experience the excitement and joy of creativity.'
Here is how it's done in Grade 7: by developing awareness and freedom through creative movement to music, improvising dialogue, and using speech and song to interpret literature. The course for Grade 9 students introduces 'playmaking' (creating and producing plays on a small scale), and adapts these plays for tape recording. Grade 12 has an almost professional workshop with courses in writing and producing plays, acting techniques, and stagecraft.

Price $2.00 from: Publication Sales,
The Ontario Institute for Studies
in Education
102 Bloor St. West, Toronto 5, Ont.

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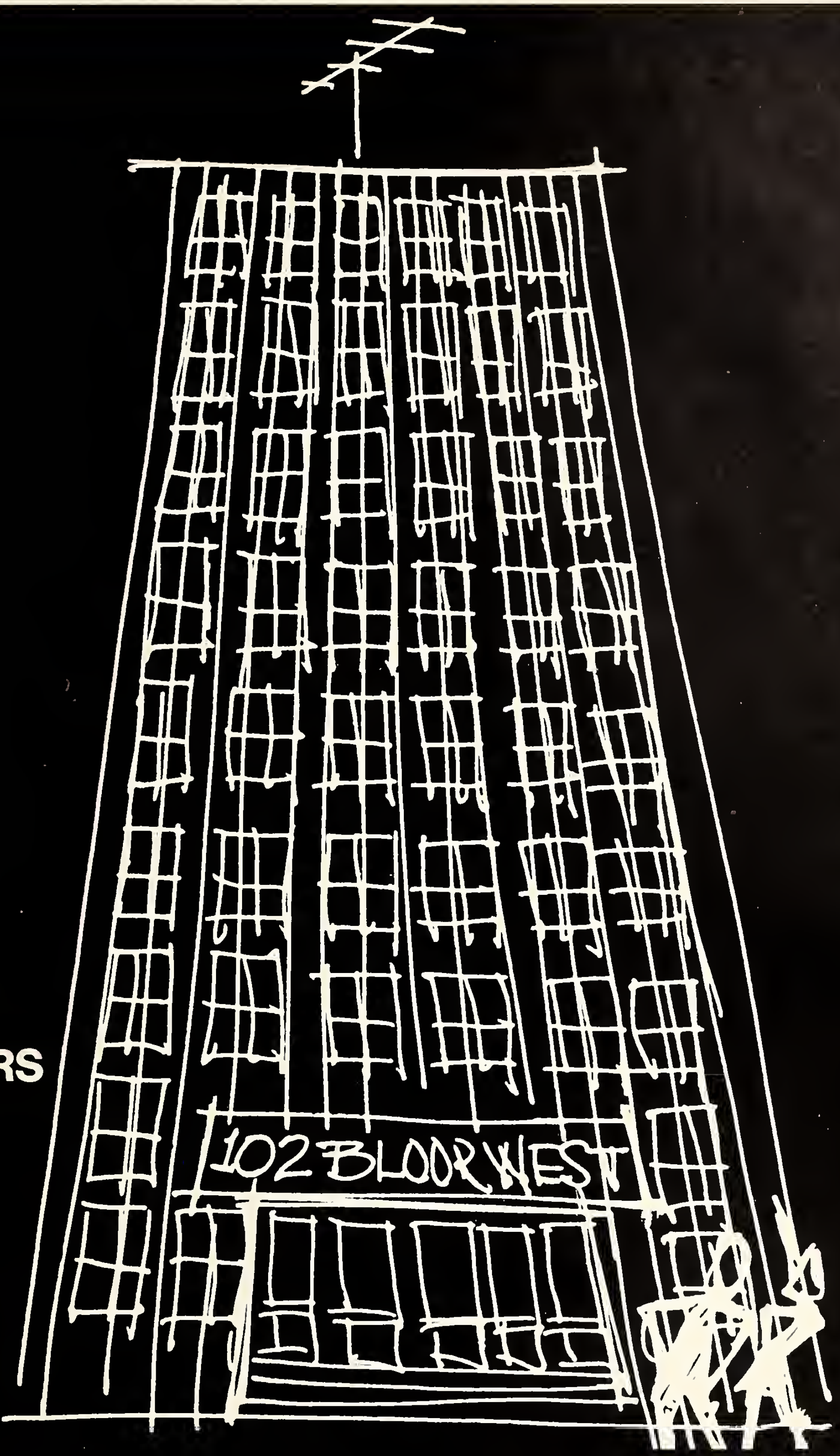
# OISELVES AS WE AND OTHERS SEE US



Before embarking on this journal, we discussed with many school principals and teachers the sort of material they thought it would be useful to include. What surprised us in these discussions was the widespread lack of information as to what OISE is doing, combined with a genuine curiosity to find out. We were surprised at the lack of information because OISE had produced and circulated many publications for teachers, both about specific educational projects and about the Institute's activities in general. There is frequently, it seems, a barrier to communication somewhere along the line between the Institute's out-basket and the hands of the teacher, a barrier that we hope this journal will be able to surmount. We were surprised at the extent of the curiosity, which ranged beyond research projects into details of the Institute's organization.

Some Institute activities will be implicit in the pages of *Orbit* because many of the articles will be written by members of the Institute staff. At the same time, we shall include articles describing specific facets of the organization, and we shall bear in mind the expressed concern to hear about research projects that are going on, even projects that are still far from complete. As for the twin perspectives of the Institute on the two following pages, we leave them to speak for themselves.

OISE is unique among educational institutes of its kind in that it combines the three functions of graduate instruction, research, and development.

## 1

OISE is affiliated with the University of Toronto and offers courses leading to master's and doctoral degrees in education. Already the Institute has granted 38 doctorates and over 900 master's degrees.

## 2

I think he's trying to communicate with us.

## 3

There are presently ten academic departments in OISE : Adult Education, Applied Psychology, Computer Applications, Curriculum, Educational Administration, Educational Planning, History and Philosophy of Education, Measurement and Evaluation, Sociology in Education, and Special Education. These departments are supported by such ancillary services as the Library and the Editorial Division.

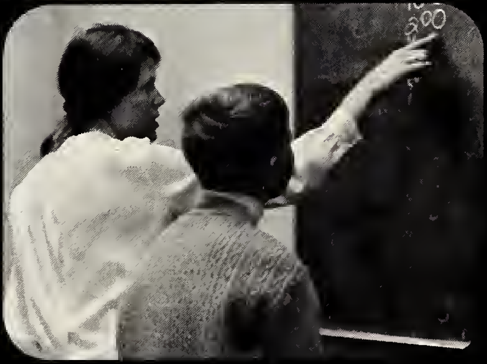
Over 1,200 teachers attended this year's summer session at the Institute.

## 4

Would you be kind enough to show me a real specimen of a real school child.

## 5

More than 300 research projects are currently being undertaken by the Institute. These projects range from studying practical educational uses of the computer to formulating evaluation tests, and from the applications of psychology to the learning process to the creation of curricula for training adult education instructors.



The Institute's Educational Clinic explores ways to help children whose learning is impeded by perceptual or other handicaps and, at the same time, helps to train teachers and supervisors in these special areas of education.

## 6

I sometimes think the value of their research is open to question.

Do you suppose their choice of the journal name *Orbit* had anything to do with running around in circles?

. . . but they prefer to imagine themselves as purveyors of sweetness and light.

Cartoons by Apps

OISE's research is based on this principle: create and adopt, but only adopt after careful testing of methods and materials. At present more than 25,000 students and 3,500 teachers in 70 school districts are involved in OISE programs and are helping to collect and evaluate research data and test completed programs.

## 7

## 8

Among the Institute's diverse activities has been the production of a comprehensive guide on school administration problems to assist trustees of the new county school boards with planning, school board/administrator relationships, and finance.

## 9

OISE's development function is to bring research findings into the classrooms of the province, and in this it will be greatly helped by the field development centres that were recently set up in St. Catharines, Peterborough, and London. The photograph shows a class of children whose cultural background places them at a disadvantage in school. OISE has developed a program, now in its third year, to help these children in forming ideas and using words so that they will be better prepared for Grade 1.

OISE sponsors numerous educational conferences, seminars, and workshops. The photograph shows a group discussion at the Institute's Conference on the Hall-Dennis Report held last April.

## 10

# POISE & I

By Helen Skelly, a teacher at Peterborough's Queen Mary Public School, who is actively engaged in 'Peterborough Operation: Individualizing Student Education.

Peterborough teachers were let in on the secret in September 1968. It was to be a project never tried before. There was to be a year of planning, and teachers were to be excused from classrooms to do the planning : teachers were to hold the reins, to decide on a new curriculum, to work out a new philosophy.

My eyes were wide open now, my ears alert. Dr. E.P. Ray, Director of the Peterborough Board of Education, was talking. 'The teachers do the teaching,' he said. 'They should be the ones to make the decisions. You will be freed for planning for two hours a week. To supervise your classrooms, we have permission to use mothers and teachers' college students.'

This was really new–but was it wise to allow untrained people into our classrooms, to learn our methods, pry into our secrets ? Again, what was the purpose of this project ; whose bright idea was it, and why was it being started ?

Dr. Ray explained that in the spring of 1968 he had been approached by a group of principals who wished to redesign the school curriculum in order to prepare children better for today's swiftly moving society–in particular, to move towards individualizing student education. It was stressed that this idea had come about in our city before the publication of the Hall-Dennis Report, which supported the need for such a redesign. Grades 4, 5, and 6 had been selected for the project because little had been changed recently at these levels, and our school, Queen Mary, was one of the six chosen to participate. Lucky us !

The intention of the project, we were told, was not to pass on a revised curriculum to other schools but to work out a process whereby a more meaningful curriculum could be established by teachers themselves. At each of the participating schools, a group of teachers would be given the job of designing and implementing instructional programs. During the school year 1968/69 (the design phase of the project), each group would work independently towards formulating a cohesive plan to be put into effect at its school the following year.

We went back to our classrooms, some of us noncommittal, all of us curious, interested, wary. Teachers to be given autonomy–freedom to think and talk, to criticize present curriculum methods ? I don't know exactly how the others felt that day, but I felt it was an opportunity, at last, for the teacher to express her concern and try to do something. Curriculum planning, individualization, pupil interest, community involvement–all these expressions were vague murmurings. Integrated programs–I thought of the sometimes blank faces in a classroom, the expectation that all pupils would be able to cope with long division, decimal points, or land forms at the same time.

We had a chance to 'opt' out–and one school did–but we all knew changes were needed, so we decided to give it a try. We didn't realize then what we were letting ourselves in for.

Parents were informed and letters returned by mothers who were willing to supervise. We were encouraged by the spontaneous help offered by Queen Mary mothers. We couldn't have got along without them. We couldn't even have got started.

The children were advised about the project at an open meeting held in the auditorium. We were doing it for them, they were told, to make school more interesting and useful; but meanwhile they had to be patient. September 1969 must have seemed awfully far away for some of those young minds to grasp.

The group meetings of Grade 4, 5, and 6 teachers at Queen Mary began. Our first job was to choose a chairman and secretary. No one was very keen to take the reins, but I hate to turn down a challenge, and when approached I accepted–besides, at the time I foresaw none of the organizational or administrative problems which would come up later, not to mention the extra hours needed before and after some of our meetings. 'Okay,' said I, 'where do we start?'

I suddenly realized it was up to me to decide. After choosing a secretary and showing a bravado I did not feel, I launched a discussion; and because of the pertinence of the Hall-Dennis Report, it was agreed that a study of this book would make a good starting point.

We examined and discussed chosen areas at our next meetings, finding many of our own thoughts expounded in the Report, along with new ideas to talk over and think through. Parent and student questionnaires were distributed and the results were compared with those from other schools. In particular, our school focused its attention on social studies. One of our first meetings included a discussion period with Walter Pitman, M.P.P. We were very pleased with his interest and also concerned about how much help or lack of it we might expect from Toronto.

A special leadership workshop for POISE participants. From left to right are: W. Nicholls (Principal of Central School); H.G. Hedges (OISE); C. Crown (Principal of Highland Heights School); R.B. Carscadden (OISE graduate student–at back); P. Roach (Principal of St. Anne's Separate School); D. Bick (teacher and POISE Chairman at Highland Heights School); and Helen Skelly, author of this article (teacher and POISE Chairman at Queen Mary School).

Within a few weeks, we attended our first workshop, together with teachers from the other participating schools. In some ways this proved disappointing, yet it was stimulating in others. The lectures by Dr. H.E. May, of the Department of Education, University of Manitoba, seemed far removed from actual classroom application. I was not ready for 'interaction analysis' and, although literature was distributed on this topic, it would have been more helpful to have had the literature ahead of time so that we would have been better prepared to take a more active part in the main workshop. However, this is not to suggest that the lectures we attended and the experiments we did were not useful. I'm sure in the weeks and months to follow we all subconsciously referred to this research in the teacher-learning process.

The workshop discussion groups were most valuable. They included planning instructional and behavioral objectives, as well as developing methods of questioning. Personnel from OISE were discussion leaders and, I felt, made us all think seriously about the teaching process–possibly more deeply and professionally than ever before. The groups consisted of one or two members from each school. This enabled us to exchange ideas and compare notes about the various paths each school was taking.

After this workshop, we settled down in earnest to look at pupils' needs and to suggest revisions in the present curriculum. We all realized that children have to go to school whether they like it or not–a thousand hours a year. They need some freedom in the behavior and response expected. Was it the curriculum or was it ourselves that needed change?

We agreed in our school that our social studies program was useless for today's needs. Children knew what was going on in the outside world–war in Viet Nam, upheaval and suppression in Czechoslovakia, man traveling in space and literally aiming to land on the moon. Our objective should be to help the child understand the world around him, not to make him memorize dates of continuous strings of explorers.

A tentative revision was made of the present course. We were concerned about eliminating anything of true value. We realized that the present system, though it may seem outdated to many, has produced great men, great leaders, and worthwhile citizens. We decided to move cautiously.

Our concern for caution increased after a trip to an open-plan school in Toronto. The building, equipment, and ideas were new and a little frightening. We decided it was too open for Peterborough!

Weekly meetings, discussions, and philosophizing continued. We planned a social studies seminar. To this seminar, we invited experts from Trent University and the high schools to discuss what they expected from children emerging from elementary schools. This seminar was extremely worthwhile. And although a few doubts were expressed about allowing children too much freedom, it was generally felt that our broad aim to develop a greater sense of responsibility in children was an excellent one. We hope more meetings of this educational range can be held.

We began to realize through our meetings, thoughts, and extra reading that if we were to have an individualized program it would not be possible to confine our efforts to social studies. Stimulated by direct inquiries from Dr. Glyn Roberts of OISE, who attended our weekly sessions, our ideas began to take shape. Even from our reverses, we learned to make concrete advances.

Working in small groups, we chose communications, socialization, problem solving, and actualization as our main areas of study, and applied them to each of our present subject areas. Even our vocabulary had to change. Such words as 'appreciation' and 'understand' were out. How does one measure 'appreciation' or 'better understanding'? We were learning how to phrase our objectives and to think collectively. We didn't hope to set the world on fire but we began working as a team.

For myself, I was finding a need to read further and see what had been done in other areas. Looking around, I discovered there were several books in our own professional library, and articles and editorials in magazines. Much resource material now seemed available. Maybe we could learn from other suggestions. As Dr. Roberts noted, we were 'traveling an unknown road towards the nongraded school, and the eyes of Ontario were upon us.'

Publicity began to come our way. Parents were beginning to ask questions. We must walk with care, test all hypotheses; we must not 'experiment' with the children.

Our second workshop proved to be most rewarding. All schools had had time to air their views and discuss their differences; teachers ceased to be isolated individuals and became active members of working teams. Each school team presented its broad philosophy and general aims. All were different and yet all alike. One school stressed a continuous program in mathematics; environmental studies, believed to be all-encompassing, would be the main focus at King George; communication skills were felt pertinent to all areas of the curriculum in St. Anne's; Queen Mary proposed joint teaching of basic skills in the morning and utilizing these skills in a much broader field of interest in the afternoon; social studies and discovery learning were points of emphasis in other schools. All schools accentuated the need to equip the child for the demands of a constantly changing society. All suggested horizontal and vertical grouping, with placement at the proper achievement level.

After this workshop we were keen to get started. We had philosophized too long. We had planned so carefully. Why wait for September?

A trial run was organized for May. We decided to move all the children involved to the top floor of our school. This was to be our POISE floor. Each teacher developed a suggested floor plan and timetable that would use the rooms and other areas available and allow for various methods such as programmed learning and audiovisual techniques. I was proud of my group. I had given them a deadline. They had met it and produced sound suggestions and a workable plan. This had meant extra work out of school hours. A consensus on the floor plan and a six-day cycle were arrived at.

Mr. Donald Benson (left), Field Coordinator of the Peterborough POISE Project and Principal of King George School, in discussion with Mr. Hank Hedges (center) and Dr. Glyn Roberts, both of OISE. During the coming year, Mr. Benson will be a development officer at OISE's newly opened field development centre in Peterborough.

Our pupils, who were grouped according to interest, studied their choice of six aspects of the local community: religion, industries, social services, geography, culture, and transportation. The periods were arranged for the first half of four afternoons each week, leaving one afternoon free for planning. Each teacher was responsible for the resources to be used, for organizing her own trips, and for setting her own objectives.

The program was most informative, and the evaluation afterwards –which included opinions from participating pupils, mothers, and teachers–showed that children enjoyed the program and learned something, that mothers are interested and want to be involved, and that the community has many available resources. We discovered that firmer guidelines are needed for group work and trips when children are working in an unfamiliar situation, and that Grade 4s and 6s are not always compatible. More important, we found that individual help is possible, learning is fun, and group leaders can be developed.

During the year, I had several personal experiences that were most rewarding. I went to the Teachers' College and gave my impressions as a teacher involved in POISE. I took part in a local TV program, 'Conversation,' and gave my opinions and hopes for POISE. I had several private interviews with parents, to whom I tried to explain my feelings that this new approach to learning could be only beneficial to their children.

The informal manner in which OISE personnel gave me guidance and advice did not make me feel as inadequate as I'm sure I seemed to them. I was grateful also to our principal, Douglas Montgomery, for giving us free rein, cooperation, and suggestions, and for the many times he went to bat for us and our new ideas. All this helped to dissolve the doubts I had had last September.

As we look ahead to next year at Queen Mary, our hopes are all-encompassing: a modern science program, art and drama, a potter's wheel, our own movies, visitors from industry, possibly a zoo in our basement, and a greenhouse on our roof–everything from a study of the abacus to a discussion about modern architecture. Our afternoon programs could be exciting! Why not?

Yes, winds of educational change are blowing through Peterborough County, and it is refreshing that they are.

*'Means have to be found at all levels for teachers to become involved in the teamwork whereby the schools of tomorrow will be created for the children of tomorrow . . .'*
*Mrs. Birgit Rohde (Sweden)*

At an international conference recently held in Berlin, the role of the teacher envisaged in the years ahead was thoroughly examined. Delegates from many countries attended the conference, and it was encouraging to discover that most of the trends in Canadian education today—for example, team teaching and nongraded schools—are influencing school systems the world over.

### International Conference on
# THE ROLE OF THE TEACHER
### in Educational Change

In this brief résumé of the conference, we have presented ideas from four of the conference papers, all of which imply that in the future the teacher's role will have to be radically redefined.

**Sweden**

A recent publication of the Swedish National Board of Education states: 'The role of the teacher is changing from that of giving information to that of stimulating and advising. The teacher will not be given totally new tasks, but the new systems of material and method will make it possible for the teacher to dedicate himself to the guidance of individual pupils, to follow and to stimulate their progress in work.'

Elaborating on this theme, Mrs. Birgit Rohde, Sweden's Deputy Superintendent of Schools, described the teacher as becoming an 'initiator-participant' in small group discussion, a 'stimulator-informer' in large group discussion, and a 'guide' in independent study. Many of the teacher's routine tasks will be taken over, she suggested, by clerical and other staff. Teachers themselves will have to work more closely with colleagues and specialist consultants in a team approach to solving educational problems and, with less time devoted to teaching and more to personal and group planning, there will be greater reliance upon preplanned systems of material and the use of media.

Mrs. Rohde observed that teacher reaction to such changes reflects both negative and positive attitudes. On the one hand, there is an unmistakable reaction of insecurity: 'The use of educational technology, the demands of teamwork, the freedom of the pupils in new learning situations—all add up to frightening a good many teachers. Some are overwhelmed: they see innovation as only a set of new demands on their already overburdened shoulders. Others are afraid of being replaced by machines or being reduced to instructional technicians. Still more just do not dare to regroup their pupils, to sit down with them at a table, to take them to the library . . . they only feel safe on the dais (but were probably never safe even there).'

On the other hand, 'there is also from teachers an unmistakable positive reaction, expressions of liberation, of having entered a new era of stimulating new experiences, of being part of a dynamic pattern of change.' Participants in a team-teaching project report: 'The project has stimulated and spurred teachers to renewal of their teaching methods. The teamwork of teachers has been a most positive experience. Planning the next unit of teaching together has been extremely stimulating, enriching, developing. Evaluating the work of pupils together with colleagues has produced a similar response. To let the pupils in on the planning has also been an advantage. We have seen problems and mistakes we would never have discovered in other ways. For the teachers, the main experience is that of realizing how valuable and fruitful teamwork is. As we are getting used to it, we become dependent on it and are getting more and more conscious of the fact that teamwork means an indispensable rationalization of our work.'

The success of innovation, suggests Mrs. Rohde, depends upon replacing teacher alienation with teacher involvement. (Mrs. Rohde is in front row center of delegates, left-hand photograph, page 20)

**United States**

Dr. Arthur W. Combs of the University of Florida, reporting on the conclusions of one of the conference task-force groups, linked the conference theme with teacher change when he said, 'if teachers do not change there will be no educational change.' He described the innovative teacher as being not only competent in his subject but also flexible, skilled at making maximum use of the physical and human resources of his community, sensitive to the world about him, able to establish effective relationships, capable of innovation regardless of circumstance, and conscious of self and world responsibility.

'Historically,' said Dr. Combs, 'these kinds of personal qualities have not been seen as major objectives of teacher education. Even where they have been regarded as valid, they have seldom existed as prime motivators or shapers of faculty policy. Modern education requires innovative teachers. But innovation is a matter of personal attitudes, beliefs, and understandings. If teacher education is truly to reach its objectives, the qualities listed above must be given more than lip service. They must play a central role in the teacher education process.

'Some persons have innovative characteristics already in high degree. Others must have them released or taught in some fashion. The teachers' college must select the best material it can to begin its work. After that, it must turn its energies in two directions'—first, to get rid of obstacles to innovative thinking, even such well tried precepts as 'to inculcate order and neatness,' 'to motivate for excellence,' or 'to develop respect for authority and scholarship,' which may, ultimately, stultify both student and teacher; and second, to teach the kind of innovative characteristics listed above 'by encouraging and strengthening such characteristics when they appear and by consciously and carefully designing programs to create such feelings and attitudes.'

**United Kingdom**

Dr. A.M. Kean of Trinity and All Saints Colleges, Troy, Leeds, dealt with some practical aspects of teacher training. His outline of the program offered by Trinity and All Saints—with emphasis on 'the free choice, planning and responsibility of the individual student'—presented something of a prototype of the ideal situation envisaged by conference participants.

For educational theory to be successfully translated into educational practice, professional experience must be an integral part of all stages of teacher training, said Dr. Kean. He stated that 'mutual agreement' should control the relationship between teacher training colleges and affiliated schools and, emphasizing the 'two-way street' aspect of this situation, he identified specific areas in which each can meet the needs of the other. In the school there exists a fertile testing ground for educational theory, innovation, and experiment, combined with the rich human resource of an experienced staff; the college provides a stimulus for further study on the part of the school staff, a consultative facility for problem solving, expertise in areas of advanced technical procedures, ancillary resources essential to educational experiment, and readily available temporary teacher replacements. School and college alike benefit from shared problem solving, cooperative production of learning materials, and the interchange of ideas and experience from two levels of the educational structure.

### India

The paper by Dr. S. Shukla, of the Asian Institute of Educational Planning and Administration, New Delhi, presented the delegates with the kind of educational problems that face the less prosperous nations. Low salaries and lack of professional status discourage qualified people from entering the teaching profession, and increased school enrollment is making the problem worse. 'A situation may well be reached,' said Dr. Shukla, 'when the very purposes of education are defeated by the poor intrinsic caliber of teachers.'

In view of this statement, it is not surprising that Dr. Shukla's essential concern lay rather with the provision of an adequate educational system than with the teacher's role alone. Inertia constitutes a grave threat to progress on all educational fronts in India. In Dr. Shukla's opinion much could be achieved by, for example, the use of good textbooks, extension of the influence of a few master teachers through a complement of assistants, and development of excellent centralized programs making widespread use of mass media.

In conclusion, Dr. Shukla identified 'two mutually complementary directions of potentially fruitful effort' open to the educational planner in a nation such as India: the provision of teacher training that is either broad and general or of a technological nature (in contrast to the 'sophisticated' training suited to more prosperous nations), and the 'development of such excellence in the higher institutions of learning as to attract and promote the variety of talent developed abroad.'

### Conference comment

K.F. Prueter, Coordinator of Field Development at OISE, who was the Institute's representative at the Berlin Conference, had this to say about his visit: 'The real significance of the conference for me was the opportunity it afforded to meet men and women from so many countries whose work is in educational research and development. Educators of all nations have common concern, and there are many research and development organizations seeking better ways of meeting the needs of today's children and youth. Each nation must find a way that is suited to its national goals. Each nation, too, has some responsibility to contribute through research to the base of universal knowledge. Further to this is the need for an international exchange of information. Each nation can profit, one from the other.

Annual conferences sponsored by the Pädagogisches Zentrum have contributed much to this exchange of information, but more needs to be done. I left the Berlin Conference with a firm resolve to find out what research and development institutes in education there are throughout the world, what their work is, what they have done, and how they operate. The Office of Field Development of OISE is presently gathering this information, and in the future our library will have it available for the use of Ontario's educators.'

The International Conference on 'The Role of the Teacher in Educational Change' was sponsored by the Pädagogisches Zentrum, a school development institute with headquarters in Berlin. This institute will be of interest to many, and the director, Dr. Kurt Spangenberg, would be pleased to hear from Canadians. Background papers and conference proceedings will be available in November on request from the Pädagogisches Zentrum, 1 Berlin 31 (Wilmersdorf), Berliner Strasse 40-41.

*If you are planning a trip to Europe, you might wish to visit:*

The School's Council in Great Britain
Mr. Geoffrey Caston
Joint Secretary, School's Council
160 Great Portland Street, London, W.1

The Experimental Center of Education
in Denmark
Mr. Uwe H. Molsen
Statens Paedagogiske Forsogscenter
Islevgard Alle 5, Kobenhavn, Rodovre

Research and development centers in
Sweden and Norway
Dr. N.E. Svensson, or Dr. Torsten Husén
National Board of Education
Fack 104, 22 Stockholm 22, Sweden

Per Dalin
Forsoksradet for Skoleverket
Postboks 8150/Oslo Dept.
Oslo 1, Norway

*Visits may be arranged by letter to the official named above.*

# ADAPTING EDUCATIONAL APPROACHES TO INDIVIDUAL STUDENTS

*David E. Hunt and John F.C. McLachlan*

*Department of Applied Psychology*
*The Ontario Institute for Studies in Education*

Most teachers try to modify their educational approach to meet the needs of individual students and, assuming they adopt the recommendations in the Hall-Dennis Report, they will be under even greater pressure to do so in the future. Much would be gained if there were a systematic way of thinking about this problem, but educational questions, and the research designed to answer them, tend to be framed in terms of the effects of educational approaches on students-in-general rather than individual students. Take, for example, questions such as these: 'Is the discovery approach better than the lecture approach?' 'Are homogeneous classes better than heterogeneous classes?' They ignore the differences among individual students. Much of the failure to develop a systematic body of knowledge about educational effects has resulted from studying such questions without understanding the interactive nature of learning–the interaction between the student and the educational approach. This issue is not just a matter of research design; when a person frames a question in terms that equate students with students-in-general, it suggests that he also thinks this way.

The matching models developed by Hunt (1966; 1968) are a specific version of the interactive view. They consist of a series of 'prescriptions'–e.g., 'Assuming that the behavioral objective has been specified, given this kind of student, then the following kind of educational approach is likely to be most effective.' A theory of matching will not necessarily provide answers that are completely novel, and indeed these prescriptions may often be very similar to what experienced teachers already know. The value lies in the potential a matching model provides for verifying the most effective combination of student and educational approach, specifying the prescriptions clearly, and making them publicly available for implementation.

How to obtain such prescriptions through research depends upon the research strategy. One may begin with one or two educational approaches and then 'go fishing' through a variety of individual differences to find the most promising match. Or one may begin with a particular kind of student and then search for the most effective educational approach for him. Finally, one may derive such prescriptions from an educationally relevant psychological theory–an approach which we will now describe.

## Conceptual-systems matching model

In the Conceptual Systems Theory originally developed by Harvey, Hunt, and Schroder (1961), a person is assumed to develop through a series of successive stages along a dimension of a conceptual level. As the person develops to a higher conceptual level, he becomes more independent, more adaptive to environmental change, more capable of tolerating stress, and generally more mature in his interpersonal relationships. Continuous development along the conceptual-level dimension requires appropriate training conditions. Under suitable training conditions, progression to the next higher stage is likely; however, if the training conditions are not suitable, arrestation is likely. Table 1 summarizes the stage characteristics and the ideal training conditions for each stage.

Each of the ideal training conditions in table 1 provides that environment most likely to facilitate moving on to the next higher stage. Beginning at the lowest point on the conceptual-level dimension, the child at the Sub I stage needs a clearly organized, well structured environment so that he can learn the cultural expectations and rules. A fairly large proportion of disadvantaged children remain fixed at the Sub I stage–presumably, in part, because of a chaotic, inconsistent home environment. The Stage I child is concerned with rules, being right, and complying with authority; progression for him requires an environment which encourages independence and initiative but provides some structure. Many middle-class children remain fixed at Stage I–presumably, in part, because of excessive parental emphasis upon conformity. In keeping with his higher conceptual level, the Stage II child is more independent, inquiring, and creative; he needs a relatively unstructured, reflective environment in which to further develop his independence. Although theories of personality development are not usually regarded as highly relevant to educational planning, the conceptual-systems matching model has been applied to educational problems in several studies. Some idea of its educational relevance can be conveyed by describing two of them.

Table 1/Conceptual systems matching model

| Stage | Conceptual-level characteristics | Ideal training conditions |
|---|---|---|
| Sub I | Impulsive, poorly socialized, egocentric, inattentive | Accepting but firm; clearly organized with a minimum of alternatives |
| Stage I | Compliant, dependent on authority, concerned with rules | Encouraging some independence within normative structure |
| Stage II | Independent, questioning, self-assertive | Allowing high autonomy with numerous alternatives and low normative pressure |

The first study (Hunt, 1966) consisted of forming classroom groups homogeneous in conceptual stage to determine whether

the person–environment matchings specified in the model (table 1) would be borne out in the classroom. After administering a battery of specially devised paper-and-pencil tests, three classroom groups were selected: a Sub I class, a Stage I class, and a Stage II class. Each consisted of approximately twenty-five Grade 9 students who were attending an inner-city junior high school. The three classes were scheduled with three teachers (a social studies, an English, and a science teacher) so that each teacher taught each of the three classes. The three teachers were unaware of the nature of the groupings.

In short, the question asked was this: Will experienced teachers, in the process of working with the three different classroom groups (even though unaware of the nature of the groups), develop educational approaches which bear some resemblance to those prescribed in the model? Each of the three teachers was interviewed after eight weeks and special emphasis was placed on the following question: 'Was there any particular approach which you found to be more effective with this group than with the other two groups?' They found the students in the Sub I class were noisy, poorly disciplined, and easily confused, so that the most effective approach with this group was to provide firm control, concrete experiences, and clear instructions. In contrast to the other two groups, the teachers found that the Sub I class could not profit from group discussion.

After describing the students in the Stage I class as orderly, quiet, compliant, and tending to ask questions which would please them, the teachers reported that this group did profit from discussions, especially debates (apparently the 'pro–con' form of the debate appealed to their categorical views), and responded well to competition with other students. The teachers described the Stage II students as much more independent and information-oriented, and capable of standing up for their own convictions. Therefore, the teachers found that the Stage II group profited most from self-selected projects and open discussion.

Although these results (and those obtained at the same school during the following year) supported the educational relevance of the model, it should be made clear that we are not advocating the universal adoption of homogeneous classroom groupings by conceptual level. Rather, the results indicate that the conceptual level of the student can be translated, through the matching model, into a differential educational prescription–one appropriate for him–which can be implemented in any of a variety of ways.

The second example of the application of the model to educational problems is drawn from the national evaluation of Upward Bound programs. Upward Bound, which might be called 'Headstart for teenagers,' is a nation-wide program sponsored by the U.S. Office of Economic Opportunity that aims at increasing the academic motivation and skill of disadvantaged high school students so that they will be more likely to attend college. As part of the program, students spend eight weeks during the summer living on a college campus and participating in a variety of activities. During the summer of 1966, there were 214 Upward Bound programs enrolling over 20,000 students; the national evaluation conducted by Hunt and Hardt (1967) consisted of an intensive study of 21 of these programs.

A battery of paper-and-pencil measures, related to academic motivation and attitude (e.g., motivation for college, self-evaluated intelligence), was administered to all of the 1,800 students in the 21 target programs at the beginning and again at the end of the summer program. The primary purpose of the evaluation was to assess the general effectiveness of these target programs, but since they varied enormously in their degree of structure (e.g., scheduling, amount of free time), it was also possible to consider the differential effectiveness of programs by using the conceptual-systems matching model as a guide. Since there were almost no Sub I students enrolled in the program, Stage I students were considered low in conceptual level (CL), and Stage II students high in CL. On the basis of the matching model, therefore, we expected that high CL students would show more positive change in flexible programs while low CL students would show more positive change in relatively structured programs.

The 21 target programs were first divided into two groups–structured and flexible–on the basis of a Program Climate Questionnaire. These two groups were further subdivided into low and high CL on the basis of the predominant conceptual level of students in the program. Students' original and final scores on the various tests of motivation and attitude were then considered in terms of the model by comparing the amount of positive change which occurred in 'matched' programs (structured programs with low CL students and flexible programs with high CL students) against the change occurring in 'mismatched' programs (structured programs with high CL students and flexible programs with low CL students). Four of the seven measures of change showed significantly greater improvement in matched programs, and two of the three remaining measures showed borderline significance favoring matched programs. So, contrary to common-sense expectation, flexible programs are not generally better than structured programs; the effect must be viewed interactively in relation to the kind of student. The results supported the matching model and underlined the importance of considering the program in relation to the kind of student in order to evaluate program effectiveness.

## Extension of the matching model

While the results from matching student CL with structure of presentation have been promising, we have also become

aware of the need to take account of other student characteristics. The model has therefore been extended (Hunt, 1968) to include other possible person–environment combinations, and in this extended model the student is viewed in terms of 'accessibility characteristics.'

Taking account of accessibility 'channels' is almost unavoidable when working with a blind or deaf student. Though less apparent, it seems equally important to consider any student in terms of channels of accessibility or openness so that the form of educational approach can be most appropriately 'tuned in' to his channel. The extended model summarized in table 2 attempts to spell out only how the student's accessibility characteristics can be coordinated with the *form* of educational presentation. (It is assumed that the *content* of the presentation has been appropriately adapted to the student's present skill level.)

**Table 2/Areas of individual variation and the corresponding aspects of educational approach**

| Student | Presentation |
|---|---|
| 1. Cognitive orientation | Structure of presentation |
| 2. Motivational orientation | Form of feedback and reward |
| 3. Value orientation | Value context of presentation |
| 4. Sensory orientation | Modality of presentation |

A project is now under way that will test several hypotheses derived from this general model. For example, in investigating the match between cognitive orientation and structure of presentation, it is expected that high CL students will profit more from a discovery approach, while low CL students will profit more from a lecture approach. Obviously, the meaning of 'profit' will depend upon the objective; certain person–environment combinations might be 'profitable' for one objective but not for another. Thus, in designing investigations of the effect of person–environment combinations, we plan to take account of such variation by measuring not only the student's achievement but his feelings about his achievement. In investigating the possible matching of motivational orientation to the form of feedback and reward, it is expected that socially oriented learners will profit more from external rewards and normative (group-based) feedback, while self-directed students will profit more from intrinsic reward and self-anchored feedback. Similar hypotheses may be derived for the students' value and sensory orientation.

McLachlan is just completing a thesis (1969) that illustrates the research approach of the matching project. In the major portion of the study, he investigated the effects of discovery versus lecture presentation on low and high CL students (Grade 11). The content of the presentation consisted of a specifically designed set of visual materials aimed at acquainting the student with the Picasso painting *Guernica*. Students in both the discovery and the lecture presentation groups were shown the same materials. On one screen they were shown the entire painting, while on a second they were shown a series of eight detailed color slides–each consisting of a portion of the original painting, along with three or four other pictures possessing a similar emotional quality. (Black-and-white photographs of the painting and four of the slides are shown above.) Students in the 'lecture' group heard a short account of the meaning of each slide, while students in the 'discovery' group viewed each slide for a comparable amount of time but were instructed to work out for themselves what the picture meant.

After the lesson, several questions were asked to elicit the student's conception of the central meaning of the picture and his attitude toward modern art. Although these data are not yet completely analyzed, it is expected that high CL students will respond better to the discovery approach and that low CL students will respond better to the lecture approach. Other investigations are now under way, and to the extent that the expected interactions are supported (or the model revised), such knowledge will be made available to those planning educational programs.

## Implementation of matching models

The reader who expected a completely packaged solution to the problem of adapting educational approaches to individual students will doubtless have been disenchanted. The matching models will at best only provide the basic information about the most effective person–environment combination or the most effective match of student with form of presentation. What the educational decision-maker will do with such prescriptions–form homogeneous classroom groups, form small groups within classrooms, individualize instruction, or simply understand the student better–will depend upon the specific situation and resources available. However, matching-model information is at least a specific step in the right direction.

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# LEARNING FROM A BOX

**Freely adapted from an evaluation report by David Stansfield (OISE) on the 1930s multimedia kit. The full report will be published at the end of 1969.**

**'In history, you just sit there and you're told. This way, you come in, you hear it, you see it, you can touch it. You've got the whole bag right in front of you.'**

The 'bag' referred to by this Grade 12 student was one of two hundred multimedia kits distributed free to Ontario schools last February. This kit–*Ten Years in a Box*, as it is called–originated through a request from Jim Hanley of the ETV branch of the Ontario Department of Education.
He asked OISE to produce some curriculum materials for use with four television programs on the Great Depression of the 1930s that were to be broadcast to Ontario secondary schools. The Institute agreed, and David Stansfield and Anthony Barton of OISE's Department of Computer Applications assembled the materials. Since then, the Box has received widespread publicity, and the general response from both teachers and students who have used it has been extremely enthusiastic–so much so that plans are now under way for University Microfilms, a multimedia publishing subsidiary of the Xerox Corporation, to manufacture and sell it.

There is, however, more to the contents of the Box than a varied assortment of materials. They embody an excitingly fresh approach to education, an approach that effortlessly combines the current trends of individualization and discovery learning and is solidly pitched at the real, if confused, world outside the classroom. Surprisingly, perhaps, both the materials and the concept are simple–a box stuffed with photographs, records, slides, newspapers, blueprints, postage stamps, whatever is relevant and boxable, which the

***Some Teachers' Comments***

*'My Grade 12 classes have just completed a three-week study of the Great Depression using your multimedia kit as the basis for their work. I feel that this has been one of the most worthwhile and enjoyable learning experiences that these students have had. I do not intend to formally test them on the knowledge and understanding they have acquired of this period of history, as I do not think it necessary: what they have learned has been made evident in other ways.'*
*Mrs. Verna Darcie, Georgetown District High School*

*'Effective teachers have for years used this sort of approach. It is agreed that the addition of film-strip material, etc., is useful, but if any good teacher had a fraction of the amount spent per kit to pursue individual research, it is possible(?) that better results might be obtained.'*
*Peter Fairburn, Dunbarton High School, Pickering*

*'This box is the glimmerings of a big important idea–attitude toward children and their learning. I like the idea of ambiguity–no directions. This is an important idea for children: to be able to take an ambiguous thing like this and provide their own structure, to sort things out for themselves.'*
*Teacher at Huron Street Public School, Toronto*

*'To me, as a teacher, the experiment was invaluable. It helped me to help certain students to overcome tension in their work. It reinforced my efforts to persuade them as to the value of research. It convinced me that our experimentation with cooperative teaching and learning does have advantages for both teacher and student. It helped to bring our parents and friends into closer association with modern classroom procedures. One result, and perhaps the best one of all, was that I, as the teacher, was gently pushed out of the picture. I am now only a resource person for students who are able to walk alone.'*
*Sister Anne Moran, Nicholson Catholic College, Belleville*

***Some taped comments of Grade 6 students at Greenland Public School, North York***

*'I want one of Adolf Hitler. I'll trade anything for it except that big blueprint.'*

*'It's sort of mixed up, but as long as it's lots of fun, that's all that matters.'*

*'I think it's great because I've got a nice big album and I can give it to one of my friends for Christmas . . . and it'll save me about $4.'*

*'I think it is everything mixed up in one.'*

*'I think it's neat, period.'*

*'I enjoy anything to get out of work.'*

*'If you have bad taste, it's great.'*

students explore as they please. Any teacher with a bit of imagination and ingenuity could make up his own box and tie it in to any subject that he wanted. So too could most students–and present the box to their class. It's the sort of activity most people enjoy, and they learn a great deal while doing it–about new facets of their subject and its links with other subjects, and about where to gather and how to prepare materials. With these ideas in mind, a look at Barton and Stansfield's approach to the makeup of their 1930s Box might be helpful.

The criteria for what should be included were simple : anything related to the 1930s that they considered interesting. Most of the material was of North American origin and relevance (a limit had to be set somewhere), and as many different communication media were used as was practicable. The topics covered in the kit include painting, sculpture, architecture, literature, poetry, popular music, advertisements, soap opera, fashions, cooking, politics, and economics–there are even items related to physics, chemistry, mathematics, and engineering. This use of very many different items–there are over a thousand–makes it possible for every student to find something of interest, and the variety of the items has resulted in the kit being used about as much in English, art, and home economics as in history classes. Furthermore, although most of the kits ended up in secondary schools, they have proved of equal interest to eight-year-olds and eighteen-year-olds, as well as to many adults that have come across them.

Barton and Stansfield produced the kit in a deliberately rough-and-ready fashion because, apart from saving time and money, they wanted the materials to be used in any way the students thought fit. If this entailed having the pictures cut up and made into collages or having filmstrips remade into slides, this was fine by them. They hoped that students would, among other things, use the kit as a base on which to build their own collection of materials about the 1930s and that the Box, containing the remains of the original kit together with new items, would be passed on from class to class in ever-changing form.

Perhaps the most significant aspect of the kit is that it is completely unstructured. There is no narrative to tie the unrelated segments together. On the records, there are no explanations, no introductions of the speakers–in fact, the labels are blank. The same applies to the filmstrips and the slides. The voices and the paintings and the photographs are left to speak for themselves.

In contrast to much curriculum material which is weakened by overprocessing, the OISE kit by its unstructured form is designed to create an emotional as well as an intellectual response. Pictures flash on the walls, two or three different sound tracks run simultaneously. The effect is a sort of chaotic and random immersion in the sounds and images of the thirties. The Horst Wessel song competes with a speech by R.B. Bennett or a Longines commercial. Slides of paintings by Salvador Dali and Grant Wood vie with filmstrips of Okies and starving Negroes. Images of millionaires' yachts are juxtaposed with photographs of soup kitchens and Hitler youth rallies. The voice of Yukon King drowns a speech by the Prince of Wales. An overhead-projector transparency of American and German fascist symbols splashes over the ceiling. Orson Welles announces that the Martians have landed. And it is the students who cause all this to happen ; it grows quite naturally out of the situation.

Where, if anywhere, the teacher fits into this situation has caused some concern–notably among teachers. But, paradoxically, the more freedom and the more diversity introduced into the classroom, the more important the teacher seems to become, for in using the kit students are faced with more problems than they are in a conventional classroom situation and they need answers to a much wider range of questions. Naturally, no teacher can know all the answers, but he can know a great deal about how and where to find them. Some students, too, do not wish to rely on their own initiative when selecting and carrying out projects, and here the guidance and experience of the teacher can be invaluable. To assist the teacher and to provide him with complete details of the kit, there is a teacher's guide, which Stansfield whimsically calls 'the comforter.'

Finally, it should be emphasized that the kit is intended to serve only as a starting point from which students can travel in any direction they please. If its effect is primarily motivational, well and good. If it causes libraries, art galleries, museums, and teachers to be besieged by hordes of students armed to the teeth with awkward questions and importunate demands for more materials, more books, and more facilities, then its creators will be well satisfied.

Now obviously Stansfield and Barton had more time, money, and resources to produce their Box than are available to most teachers. Nevertheless, the putting together of a package of this kind, even if it is much less elaborate, would be a feasible proposition for any teacher with an innovative bent. And if any teachers are inspired to try, we should be glad to hear from them–what materials they used and how students reacted–so that we can publish details in a future issue.

# Etude Socio-Pédagogique des Elèves de 1968/69 à l'Ecole Normale de Sudbury

J.R. Cloutier, associé à la recherche, et Dormer Ellis, professeur agrégé, OISE.

Sommaire d'une étude statistique faite par les auteurs pour le Bureau de développement de OISE.

Sur les treize écoles normales de l'Ontario, deux sont réservées à la formation des candidats d'expression française, celles d'Ottawa et de Sudbury. Ensemble elles assurent le maintien et le développement du réseau de 400 écoles élémentaires de langue française disséminées à travers la province desservant environ 100,000 élèves. *Qui sont ces futurs instituteurs* et *quelles sont les raisons qui les poussent à opter pour la carrière de l'enseignement ?* Voilà les questions qui servent de base à cette étude qui se limite aux élèves actuels de l'Ecole Normale de Sudbury. Par là même, nous ne faisons qu'étendre l'étude similaire faite récemment à l'Ecole Normale de l'Université d'Ottawa par P. Xatruch et Dormer Ellis. Ainsi donc le portrait est complet de la relève que préparent ces deux institutions francophones. Cette étude s'inscrit aussi dans la ligne de 'l'Atkinson Study' de OISE portant sur les élèves inscrits en treizième année en 1955-56 et particulièrement sur l'analyse des candidats aux écoles normales (Ellis *et al*) et sur leurs dix premières années d'expérience dans l'enseignement (Ellis et Stevenson). Ces études, cependant, ne faisaient pas la distinction entre les élèves francophones et anglophones.

Les résultats de cette nouvelle étude sont basés sur les réponses que les normaliens ont données à deux questionnaires et sur des renseignements fournis par les autorités de l'Ecole Normale de Sudbury.

L'Ecole Normale de Sudbury comme celle d'Ottawa compte deux cours : le cours d'un an réservé aux candidats qui ont déjà terminé leur treizième année ou l'année préliminaire et le cours de deux ans qui permet de faire l'équivalent de la treizième année tout en acquérant la formation professionnelle. A Sudbury, le nombre d'élèves inscrits était de 169 et se répartissait comme suit : 68 au cours d'un an et 101 au cours de deux ans. De ce dernier groupe, 70 en étaient à leur année finale et 31 débutaient leur cours.

Dans chaque cours, il y a quatre fois plus de filles que de garçons ; les trois-quarts des élèves étaient âgés lors de leur entrée de 18 à 20 ans. Pour le quotient intellectuel, 60 pour cent des élèves se classent dans les catégories variant entre 101 et 115.

Quant au milieu familial, la médiane du nombre d'enfants par famille se place à six, le français est la langue courante pour 95 pour cent des familles, les mères ont plus d'années de scolarité que les pères, et 60 pour cent des parents ont un revenu annuel allant de $5,000 à $10,000 par année.

Le rapport inclut quelques aperçus du succès académique des normaliens durant leurs cours primaire et secondaire. Par exemple, 6 pour cent de ces élèves ont échoué une année au niveau élémentaire, tandis que 30 pour cent ont été accélérés. Durant les années d'école secondaire 22 pour cent des élèves ont redoublé une fois. La note finale obtenue soit en 12e année, soit en 13e, se situe entre 60 et 69 pour cent dans près des trois-quarts des cas.

La dernière section du rapport décrit les facteurs de motivation qui ont joué chez ces élèves dans leur choix de la carrière de l'enseignement et du programme d'études. La raison fondamentale qui est donnée par plus de la moitié des répondants relative à leur choix de la carrière est axée sur un sentiment de dévouement et d'affection pour les jeunes, de même que sur l'idée de servir la communauté humaine. Voici un exemple typique : 'J'aime les enfants. J'ai toujours admiré le travail de mes instituteurs. J'ai à accomplir un travail qui me permet un contact personnel avec d'autres gens et de sentir que je contribue à l'amélioration de la société.' L'attrait du salaire, la stabilité de l'emploi et son prestige ne sont mentionnés que par 11 pour cent des cas. Plusieurs, 7 pour cent, ont basé leur choix sur un besoin de communiquer des idées, de partager leur richesse culturelle avec les jeunes : 'L'enseignement est un moyen direct de communiquer avec les enfants. J'aime à leur transmettre des connaissances car ils sont toujours prêts à apprendre du nouveau.' 'Je veux garder un contact avec les générations tout en leur laissant un peu de la mienne.'

En plus de la valeur intrinsèque de la profession, des motifs externes tels que l'influence des parents ou des amis ont pu peser sur leur choix. Les deux-tiers des élèves indiquent avoir reçu une telle influence venant surtout de la part de leurs instituteurs, puis de leur mère. Ce qui peut surprendre c'est l'influence minimale attribuée au conseiller d'orientation. La réponse à cela serait peut-être que l'instituteur s'identifie souvent à l'orienteur.

Le fait que très peu d'écoles secondaires en Ontario offre la 13e année en français a poussé beaucoup d'élèves à entrer à l'Ecole Normale après la 12e année pour bénéficier du programme particulier réparti sur deux années dans un climat plus favorable à la culture française. Ce programme permet de faire en français la 13e année et en même temps de poursuivre le cours d'entraînement pédagogique et professionnel : 'Deux années me donnaient plus de temps pour approfondir mes façons d'enseigner.' 'Ici, j'ai du temps pour améliorer mon français.'

D'autre part les élèves qui ont déjà complété leur 13e année aiment le cours régulier d'un an parce qu'il ne mélange pas les matières académiques avec les cours de pédagogie. L'aspect financier aussi a exercé une influence sur le choix de ce cours : 'Je suis demeuré par chez-moi pour faire ma treizième, ce qui économise beaucoup.'

Ce sommaire donne un aperçu de ce que contient l'analyse que nous avons faite sur les normaliens de Sudbury. Des copies de ce rapport sont disponibles au Bureau de développement de OISE. Nous espérons que ce rapport sera complété par une prochaine étude dans quelques années montrant le chemin parcouru par ces élèves, leur succès ou leurs échecs dans l'enseignement, et la relation entre ces facteurs et les variables déjà analysées.

# TEACHING AIDS FROM THE COMMUNITY

## Imperial Oil Limited

From time to time, as information on educational materials from business, industrial, and community organizations becomes available, a brief résumé will be presented in this column. While not everything mentioned will be new to all readers, it is hoped that the volume of 'newness' will be sufficient to establish this as a useful service. Readers are reminded that the production of teaching aids is extremely costly, and requests for them should be made only when their use is assured.

### PUBLICATIONS

Available from:
Imperial Oil Limited
111 St. Clair Avenue West
Toronto 7, Ont.

*Imperial Oil Review*
(available to adults on request, without charge)
A bimonthly magazine, published in English and French, describing the activities of Imperial Oil Ltd. and the Canadian oil industry and containing articles on Canadiana; science and technology; health, medicine, and safety; contemporary life and problems; human interest stories; and business and economics. The magazine is illustrated with sketches and with black-and-white and color photographs.

*Historical Sketch Portfolios*
(available to teachers on request, without charge)
The series comprises four portfolios of black-and-white sketches taken from original drawings and paintings by the late Charles W. Jefferys, R.C.A., LL.D. Accompanying texts prepared by Malcolm G. Parks, M.A., and W. Stewart Wallace, M.A., LL.D.
Titles of the portfolios are as follows: 'Discoverers and Explorers in Canada 1497–1763,' 'Discoverers and Explorers in Canada 1763–1911,' 'The Rebellions of 1837 in Upper and Lower Canada,' and 'The Story of the Pioneers and How They Settled in Canada.'
Since the series was prepared primarily for teachers of Canadian history, it may already be familiar to many readers.

*Oil: Yesterday, Today and Tomorrow*
(available to pupils and teachers on request, without charge)
A survey of the oil industry's operations, from exploration to manufacture and marketing, abundantly illustrated with sketches, diagrams, charts, and photographs. While this publication repays reading for the sake of interest alone, its comprehensive treatment of the oil industry ensures its reference value.

### FILMS
### 16 mm. in full sound and color

To obtain any of the films listed below, Ontario readers should write to Imperial Oil Limited, 1 Duncan Mill Road, Don Mills, Ont. There is no charge for use. Imperial Oil pays the outgoing postage; return postage is the responsibility of the borrower.
A list of titles and running times follows.

**Agriculture:**
*A New Word for Farming*–25 minutes–the role of science in modern farming
*Farm Tractor Safety–A Family Affair*–22 minutes–the story of a community safety project
*Matching Furrows*–20 minutes–the 1963 Plowing Match, Caledon, Ontario

**People and Places:**
*Brasilia*–13 minutes–ultramodern architecture; early construction in Brazil's new capital city
*Most Lovely Country*–31 minutes–the growth of British Columbia's economy from its natural heritage
*Mural*–27 minutes–the planning and painting of some of Canada's largest murals
*Newfoundland Scene*–38 minutes–a prize-winning film on Newfoundland and her people
*Stampede Stopover*–11 minutes–the Calgary stampede
*The Legend of the Raven*–14½ minutes–a national and international award-winning film based on an old Eskimo legend
*The Loon's Necklace*–10 minutes–the well-known and much honored film presentation of an old Indian legend
*The Pirogue Maker*–12½ minutes–a film record of the making of boats from tree trunks by Louisiana's bayou people
*The Seasons*–16 minutes–a presentation of nature's mood in the changing seasons
*Village in the Dust*–18 minutes–the outcome of digs on the site of a prehistoric Indian village at Pickering, Ontario

**Petroleum:**
*A Mile Below the Wheat*–16 minutes–a film documentary of the discovery of oil at Leduc, Alberta; produced in 1948 and selected for showing and special mention at the International Festival of Films, Edinburgh
*Backyard Bonanza*–14½ minutes–a humorously presented graphic explanation of oil-well drilling
*Decision to Drill*–28 minutes–a documentary drama of the search for oil and natural gas
*Energetically Yours*–13 minutes–an award-winning cartoon story of the harnessing of energy
*Flowing Solids*–16 minutes–the production of high-octane gasoline
*The Human Element*–29½ minutes–some of the side benefits that have resulted from petroleum research
*Underground East*–16 minutes–the story of the laying of one of the world's longest pipelines

**Science off the Shelf:**
This series includes a variety of films, each with a running time of 13½ minutes, dealing with the preparation and use of the following products: cosmetics, detergents, paints, pesticides, plastics, polishes, rubber.

**Miscellaneous:**
*Gentlemen Start Your Engines*–23 minutes–car racing at the Indianapolis 500
*Once Upon a Barge*–15 minutes–a junior geologist's account of his study of the Mackenzie River delta country
*Molecules for Burning and a Million Other Things*–27½ minutes–the story of petroleum refining and research

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FILMS
16 MM FILMS FROM IMPERIAL OIL
PORTFOLIO No 1
CONTENTS
DISCOVERERS AND EXPLORERS IN CANADA — 1497-1763
IMPERIAL
NO TURNS

Fisher Park High in Ottawa is a composite school with a student enrollment of thirteen hundred. Founded in 1949 and named after Harold Fisher, a former mayor of Ottawa, the school is one of Ontario's pioneers of educational change.

About five years ago, Fisher Park High introduced subject promotion throughout the school so that no student had to repeat any subject which he or she had passed. This first step towards eliminating a rigid grade system led in turn to individual programs for students and the extensive use of a computer to help in the formidable task of working out a timetable. In this operation, students each fill out a program indicating the subjects they wish to take for the following year; these programs are then transferred to punched cards. At the same time, the school administration draws up a master timetable which is also run through the computer. Student cards and timetable are then run against each other, and those cards that are incompatible are rejected. The timetable is subsequently amended, and the computing process is gone through again (perhaps several times). When this process is completed, only a few students may be required to change a subject to suit the timetable. By autumn 1970 the school plans to introduce a complete modular system based on twenty-minute units that will allow even greater flexibility in the timetable.

Student performance is evaluated by a testing program throughout the year, and to facilitate the operation of individual programming, a credit system has been started. To obtain a Secondary School Graduation Diploma, each student requires at least 27 credits, of which 13 are obligatory: English–4, Physical Education–3, History–2, Geography–1, Mathematics–2, Science–1. Some academic subjects are offered in three streams–the four-year, the regular five-year, and the honors. (Details of this type of system are given in Section A of *Circular H.S.I 1969–70,* published by the Ontario Department of Education.)

'A valuable bonus from our system,' says Principal Jake Enns, 'has been the creation of an atmosphere in which teachers feel more at liberty to experiment with new teaching methods. At the same time, we have enlarged our guidance department to help students with subject choice, and we have established an elaborate communications network to keep parents informed about what is going on.' Although the greater freedom offered to the students often requires a change in teacher attitude, it is as yet too difficult to assess the full implications of the many changes introduced at Fisher Park High. For the past year, OISE has had a representative at the school who, through lengthy interviews with the staff and students and through personal observation, has been making a comparative evaluation of the social environment created by the new system. We hope to publish the results of this evaluation in a later issue. At this stage, we can merely acknowledge the example of one of several Ontario schools that have had the enthusiasm and courage to try out new ideas.

# PROFILE OF A SCHOOL 1

## Fisher Park High